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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,895

07/18/2006

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YAMA:127

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EXAMINER

PAUL, DISLER

ART UNIT

PAPER NUMBER

2615

MAIL DATE

DELIVERY MODE

07/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,895	KONAGAI ET AL.	
	Examiner	Art Unit	
	DISLER PAUL	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/20/06; 2/15/08</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, 6, 8-10 are rejected under 35 U.S.C. 103(a) as being anticipated by Asada et al. (US 2006/0050897).

Re claim 1, Asada et al. disclose of the array speaker apparatus comprising: a plurality of speaker units arranged in an array; a first radiation control units that drive the speaker units with first driving signals so that sounds corresponding to a first audio signal are radiated to wall surfaces on the left and right sides of a listening position; and a second radiation control unit that drives the speaker units with second driving signals so that sounds corresponding to a second audio signal the same as the first audio signal are radiated directly to the listening position; and a first and second delay circuits that selectively add predetermined delays in the first and second driving signals respectively to control the directivity of the first and second audio signals; wherein a virtual sound source is created between the array speaker apparatus and the wall surface (fig.15,22-23; par[0101,0137-8,0066]/sound wt delay with array speaker for virtualization).

Re claim 2, the array speaker apparatus according to claim 1, comprising means for correcting one or both of a frequency-gain characteristic and a frequency-phase characteristic of at least the first audio signal out of the first audio signal and the second audio

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signal so that sounds arriving at the listening position have desired properties (fig.18-21; par [0131]).

Re claim 3, Asada et al. disclose of the array speaker apparatus comprising: a high pass filter for extracting a first audio signal of a middle/high frequency band from an input audio signal of each surround channel; a low pass filter for extracting a second audio signal of a low frequency band from the input audio signal; a plurality of speaker units arranged in an array; a first radiation control unit that drive the speaker units with first driving signals so that sounds corresponding to the first audio signal are reflected by a wall surface behind a listening position prior to reaching the listening position; and a second radiation control unit that drive the speaker units with second driving signals so that a sound pressure level of sounds corresponding to the second audio signal reaching the listening position is smaller than a sound pressure level of sounds corresponding to the first audio signal reaching the listening position; and a first and second delay circuits that selectively add predetermined delays in the first and second driving signals respectively to control the directivity of the first and second audio signals; wherein a virtual sound source is created between the array speaker apparatus and the wall surface (fig.14 wt (17-18); fig.15,22-23; par[0101,0137-8,0066-0067]; par [0155,0107,0095]/low/high filter wt behind sound heard louder than frontal sound).

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Re claim 4, the array speaker apparatus according to claim 3, wherein: assuming that a spatial point where sounds radiated from the plurality of speaker units arrive simultaneously is regarded as a focus, the first radiation control means and the second radiation control means drive the speaker units so that a focus of sounds corresponding to the second audio signal is set to be farther than a focus of sounds corresponding to the first audio signal (par [0006,0008], fig.2-3/surround sound should be less than sound of direct").

Re claim 6, Asada et al. disclose of the array speaker apparatus, comprising: a plurality of speaker unit arranged in an array; a first audio signal generating circuit that generates first audio signals based on an input audio signal; a second audio signal generating circuit that generates second audio signals based on the input signal adders that add the first audio signals to the second audio signals and input addition results to the plurality of speaker units; and a directivity control unit that controls directivities of first output sounds output by the plurality of speaker units based on the first audio signals, and directivities of second output sounds output by the plurality of speaker units based on the second audio signals; wherein the first audio signal generating circuit and the second audio signal generating circuit include delay circuits for delaying input signals, respectively; and wherein the directivity control unit controls the delay circuits so as to realize the directivities of the

first output sounds and the directivities of the second output sounds (fig.14,16; (fig.15,22-23; par[0101,0137-8,0066]/sound wt delay with array speaker for virtualization).

Re claim 8, the array speaker apparatus according to claim 6, wherein the first audio signal generating circuit and the second audio signal generating circuit further include characteristic correction circuits for performing desired characteristic correction upon the input signals, respectively (fig.3; par [0013,0061]/delay characteristic as per sound to direct toward specific point).

Re claim 9, the array speaker apparatus according to claim 8, wherein the characteristic correction circuit of the first audio signal generating circuit includes a high pass filter, and the characteristic correction circuit of the second audio signal generating circuit includes a low pass filter (fig.14,16 and see claim 3 explanation).

Re claim 10, the array speaker apparatus according to claim 9 with the first and second signal generating circuit, wherein the signals include multipliers for adjusting signals delayed by the delay circuits into desired levels, respectively (fig.18-21; par [0137]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. (US 2006/0050897) and further in view of Goudie et al. (US 7,319,641 B2).

Re claim 12, Asada et al. disclose of the array speaker apparatus with a plurality of speaker units, comprising: a delay circuit that delays an input signal by delay times set for the speaker units respectively; a directivity control unit that controls the delay times of the delay circuit so as to determine directivities of output sounds output by the plurality of speaker units (fig.1-3;16;22); and filters that are provided for the speaker units respectively, and filter outputs of the delay circuit and output the filtered outputs to the speaker units; (fig.4/frequency/phase of each filters may be changed; fig.22-23; par[0064]).

While, Asada et al. disclose of the having variable filters and determining of cut off frequency of the filter. But, Asada et al. fail to disclose of the specific wherein cut-off frequencies of the filters are different from one another. But, Goudie et al. disclose of an

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array of speakers wherein the similar concept of having the cut-off frequencies of the filters are different from one another (fig.2, 9A-B; col.10 line 50-55) for the purpose of improve steerability of sound beams having different travel paths before reaching the listener.

Thus, taking the combined teaching of Asada et al. and Goudie as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Asada et al. with the concept of having the cut-off frequencies of the filters are different from one another for the purpose of improve steerability of sound beams having different travel paths before reaching the listener at varying frequencies.

Re claim 13, the array speaker apparatus according to claim 12, wherein each of the cut-off frequencies of the filters is set to be lower as a speaker unit corresponding thereto is located at a larger distance from a center of the array speaker (Goudie, col.10 line 50-60).

Re claim 5, the array speaker apparatus according to claim 3, wherein: the first radiation control means and the second radiation control means drive the speaker units so that an angle between a radiation direction of sounds corresponding to the second audio signal and a frontal direction of the array speaker apparatus is larger than an angle between a radiation direction of sounds corresponding to the

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first audio signal and the frontal direction (fig.7 wt low (82,84) and high (88); col.8 line 1-6).

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. (US 2006/0050897) and further in view of Kawano (US 6,816,597 B1).

Re claim 11, the array speaker apparatus according to claim 10, However, Asada et al. fail to disclose of the specific wherein the multipliers are provided for the speaker units, respectively, with the gain coefficient of the multiplier of the signal (kawano, fig.1-2,4 wt (1,R); col.7 line 1-10, col.5 line 50 & col.6 line 15 ; fig.1-6; col.1 line 20-25 & line 50-57; col.3 line 65 & col.4 line 8) for the purpose of setting the factor coefficient signal to achieve the proper stereophonic feeling. Thus, taking the combined teaching of Asada et al. and Kawano as a whole, it would have obvious for one of the ordinary skill in the art to have modify Asada et al. with the multipliers are provided for the speaker units, respectively, with the gain coefficient of the multiplier of the signal for the purpose of setting the factor coefficient signal to achieve the proper stereophonic feeling. However, the combined teaching of Asada et al. and Kawano as a whole, fail to disclose of the wherein the gain coefficient being zero. However, official notice is taken the concept of having a gain coefficient being zero is simply the inventor's preference, thus it would have been obvious for one of the ordinary

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skill in the art at the time of the invention to have modify the combined teaching of Asada et al. and Kawano as a whole, by incorporating the specific wherein the gain coefficient being zero for minimizing certain processing method.

6. Claim 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. (US 2006/0050897).

Re claim 14, Asada et al. disclose of the array speaker apparatus according to claim 1 with virtual sound source (fig.5,15), However, he fail to disclose of the specific of the position of the virtual sound source and specifically wherein the virtual sound source is located diagonally front with respect to the listener. However, the concept of having adjusted the virtual source location around the listener and specifically wherein the virtual sound source is located diagonally front with respect to the listener is simply the inventor's preference. Thus, it would have been obvious for one of the ordinary skill in the art to have modify Asada et al. with the virtual sound source is located diagonally front with respect to the listener for purpose of enable surround stereo reproduction without having to dispose the speakers behind and laterally of the listener.

Re claim 15 has been analyzed and rejected with respect to claim 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./
Examiner, Art Unit 2615

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2615